WHAT IS CLAIMED IS:

1. A semiconductor wafer with a front surface and a back surface and an epitaxial layer of semiconducting material deposited on the front surface,

wherein a surface of the epitaxial layer has a maximum density of 0.14 localized light scatterers per cm 2 with a cross section of greater than or equal to 0.12 μm ; and

the front surface of the semiconductor wafer, prior to the deposition of the epitaxial layer, has a surface roughness of 0.05 to 0.29 nm RMS, measured by AFM on a 1 μ m \times 1 μ m reference area.

- 2. A process for producing a semiconductor wafer with a front surface and a back surface and an epitaxial layer of semiconducting material deposited on the front surface, wherein the process comprises the following process steps:
- (a) a stock removal polishing step as the only polishing step;
 - (b) cleaning and drying of the semiconductor wafer;
- (c) pretreating of the front surface of the semiconductor wafer at a temperature of from 950 to 1250 degrees Celsius in an epitaxy reactor; and
- (d) depositing of the epitaxial layer on the front surface of the pretreated semiconductor wafer.

- 3. The process as claimed in claim 2, comprising polishing the front surface and the back surface of the semiconductor wafer simultaneously during the stock removal polishing.
- 4. The process as claimed in claim 2, comprising polishing only the front surface of the semiconductor wafer during the stock removal polishing.
- 5. The process as claimed in claim 2, comprising carrying out the pretreating referred to in step (c) immediately before the epitaxial depositing in the epitaxy reactor.
- 6. The process as claimed in claim 2, comprising treating the semiconductor wafer, in a first step of the pretreating according to step (c), in a hydrogen atmosphere at a temperature of from 950 to 1250 degrees Celsius.
- 7. The process as claimed in claim 2, comprising treating the semiconductor wafer, in a second step of the pretreating according to step (c), at a temperature of from 950 to 1250 degrees Celsius in a hydrogen atmosphere to which gaseous HCl has been admixed; and removing from 0.01 to 0.2 µm of material from

the surface of the semiconductor wafer at an etching rate of 0.01 $\mu\text{m/min}$ to 0.1 $\mu\text{m/min}$

- 8. The process as claimed in claim 2, wherein the epitaxial layer deposited in step (d) has a thickness of 0.3 μ m to 10 μ m and is deposited at a temperature of from 600°C to 1250°C.
- 9. The process as claimed in claim 2, wherein the epitaxial layer deposited in step (d) is rendered hydrophilic using an oxidizing gas.

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- 10. The process as claimed in claim 2, wherein the epitaxial layer deposited in step (d) is rendered hydrophilic by wet-chemical means.
- 11. In a method for producing integrated semiconductor components, the improvement which comprises

utilizing an epitaxially coated semiconductor wafer produced by the process of claim 2 for producing said components.